

Superorders.	Orders.	Suborders.
Euglossata *	{ Hymenoptera. Lepidoptera. Diptera	{ Diptera (genuina). Aphaniptera. Pupipara.
Elytrophora † . .	Coleoptera	{ Coleoptera (genuina). Strepsiptera.
Eurhynchota ‡ . .	Hemiptera	{ Homoptera. Heteroptera. Physapoda. Mallophaga.
Phyloptera	{ Neuroptera Pseudoneuroptera . . Orthoptera Dermatoptera.	{ Trichoptera. Planipennia.
		{ Odonata. Ephemerina. Platyptera.
Synaptera §	Thysanura	{ Cinura. Symphyla. Collembola.

XIX.—On Ure's "Millepore," *Tabulipora* (Cellepora) *Urii*,
Flem. By JOHN YOUNG, F.G.S.

To the Editors of the 'Annals and Magazine of Natural
History.'

GENTLEMEN,—In vol. xiii. (4th series) of the 'Annals'
(for 1874) there is a short paper by R. Etheridge, Jun., en-
titled "Observations on *Chaetetes tumidus*, Phill.," in which,

* We propose the name Euglossata for the highest insects, comprising
those orders which, besides having the mouth-parts (either the first or
second maxillæ or both) modified so as to sip, suck, or lap up liquid food,
also have the body cylindrical and the thorax more or less spherical and
concentrated.

† This term is proposed for the Coleoptera alone.

‡ This term is proposed for the Hemiptera, in all of which, except the
Mallophaga and Physapoda (*Thrips*), the mouth-parts are united to form
a sucking-beak.

§ This term is proposed for the Thysanuran apterous Hexapods, which
are perhaps nearly the morphological equivalents of either of the three
other superorders.

after referring to the several palæontologists who had noticed the structure of this organism, he describes some sections that he had prepared, and which are figured in plate xi. figs. 1 to 3. At page 195 he says, "This is probably the fossil figured by Ure in his 'History of Rutherglen and East Kilbride' (pl. xx fig. 1), and described by Fleming as *Cellepora Urei* (Brit. Animals, 1828, p. 533). If this is so, Ure was the first to figure *Chaetetes tumidus*; and it, like many of his figures, is very faithfully drawn."

Recently I have discovered what I believe to be an important internal character in the structure of the organism which Ure figured and described in 1793 as a species of "Millepore," and which will, I think, be the means of distinguishing it from Phillips's species, with which it has all along been confounded, from the great resemblance of the external characters in the two organisms.

This new character consists of a series of thin, perforated tabulæ that exist in the outer portion of the tubes of the larger corallites. The perforation or central opening in these tabulæ is of a roundly crescentic or reniform shape, and has a thickened edge or rim around its margin, its diameter being one third the width of the tubes. The concave edge of the opening in branching specimens is invariably turned towards the lower end of the branches; so that from this feature in the form of the perforation one is always able, in fragments, to say which was the lower or upper end of any branch in specimens where it could not be so determined from any of the other characters seen on the surface.

The tabulæ are numerous, their number varying from five to eight in each corallite, they being only about the diameter of the tubes apart, and are apparently confined to the outer portion, where the tubes bend from the nearly vertical position they occupy within the centre of the branches to open at right angles on the surface.

I first discovered this new character in thin incrusting specimens of the organism, which seems to be its first or earliest stage, and in which it is generally found attached to stems of crinoids, corals, and shells, in spot-like crusts that vary in size from one fourth of an inch to two or more inches in length. From this first thin incrusting stage the organism afterwards grew, in a branching manner, as described by Ure, until it attained a height, as seen in some specimens, of more than 3 inches. The branches, which are dichotomous and have rounded extremities, seldom exceed more than from 2 to 3 lines in diameter, their section varying from round to oval; but they are often found much crushed when imbedded in soft shale.

The external characters of Ure's "Millepore" vary somewhat in its several stages and in different specimens. In young examples the cells are bounded by thin walls, and the openings are polygonal. In older specimens the outer walls become much thickened, and the cell-openings are round or oval. In well-preserved specimens the outer surface of the walls is often seen to be minutely tuberculated or spinose, these tubercles, in polished sections, appearing as small pores in the walls; but they are not tabulated. Other, larger pores that exist in the walls at the angles between the larger cells, became filled with perforated tabulæ, like those in the tubes of the larger corallites, as the organism increased in diameter; but both of these sets of smaller pores disappear in the walls as sections of branches are ground from their surface to near the central axis, the walls there becoming thin and the cells polygonal, as seen in the earlier stage of the organism.

Ure's "Millepore" has maculæ on its external surface, and on one incrusting specimen that I have examined, these maculæ rise into distinct monticules. They are best seen on incrusting specimens of the organism, but are also to be found on many of the branching examples.

The maculæ are generally about 2 lines apart, and consist of spots in which are grouped a few very small cells, around which there are other cells that are somewhat larger in their openings than those of the normal size that fill in the spaces around the various maculæ.

The perforated tabulæ, which form the distinctive internal character of Ure's "Millepore," can be seen in nearly every specimen in which the structure has not been too much destroyed through mineralization of the organism. In the limestone shales of the East Kilbride district, where Ure obtained his specimens, it is abundant in several localities, but generally in fragments of branches. If any of these are rubbed down on a fine polishing-stone a little distance below the surface and at right angles to the mouths of the corallites, the perforated tabulæ are readily seen. Having prepared numerous specimens, both as transparent and opaque sections, for examination under the microscope, I find that those which show the tabulæ in the greatest numbers within the corallites are the opaque sections. This arises from the fact that the branches are often curved, and that the tabulæ do not all lie in the tubes at the same level, so that in flat sections only those few tabulæ that happen to be at the surface remain after grinding the specimens to transparency; while in opaque sections we not only see those perforated tabulæ that are at

the surface, but we also see many of those that are lying deeper in the tubes, shining up through the transparent calcite with which many of them are filled.

When specimens of the organism are ground so as to show the central axis of the branches in either cross or horizontal sections, the perforated tabulæ then show themselves in many of the tubes of the corallites as a series of small, thin, projecting points with a little rounded knob at their ends. This latter character is due to the thickened edge of the tabulæ, which, as formerly mentioned, forms a rim around the perforation. When the tabulæ in any of the tubes happen, however, to be cut in section on either side of the perforation, they are then seen to extend across the tubes in a complete manner; and this might deceive any one examining such a section as to their perforated character, or the existence of these little rounded knobs; but they are to be found in every well-preserved specimen in which the section cuts through the centre of the perforated tabulæ and not through either side.

Having stated this much regarding the peculiar internal structure of Ure's "Millepore," I shall not now enter into any lengthened comparison of its relation to those other forms with which it has been so long identified. In the Scottish lists of Carboniferous fossils it will be found catalogued under the several genera in which Phillips's species has been placed, viz. *Calamopora*, *Chatetes*, and *Stenopora*, but with Phillips's specific name of *tumida* attached. Fleming's name *Cellepora Urei* seems in a measure to have been lost sight of by palæontologists since his time, although the organism will be found under that name in Morris's 'Catalogue of British Fossils,' 1844, in the list of Polyzoa, as well as in the note by Mr. Etheridge, to which I have already referred.

The specimens examined by Mr. Etheridge as "probably" *Cellepora Urei*, Flem., and which he identifies with *Chatetes tumidus*, Phill., appear to me strongly suggestive, both from his figures and description, that it was really Ure's "Millepore" that he had under examination; but his sections either did not show or he had overlooked the existence of those perforated tabulæ that form the distinctive internal character of the organism.

Phillips's coral *Chatetes tumidus*, with which Ure's "Millepore" has always been confounded from its external resemblance, has now been placed by Prof. A. Nicholson amongst the *Monticuliporæ* in his subgenus "*Heterotrypa*;" and in his most recent description of this species ('Palæozoic Corals,' *Monticulipora*, pp. 121, 122) he describes the tabulæ in the corallites as "horizontal" and "complete," not perforated

as in Ure's "Millepore." At page 103 Prof. Nicholson, in defining his subgenus "*Heterotrypa*," states that the corallum "consists of two sets of corallites of different sizes," and that "in all the corallites the tabulæ are complete, and the small tubes are more closely tabulate than the large ones." He, however, does not mention the existence of tabulæ in the small tubes in his description of the internal structure of *Heterotrypa tumida*, Phill., nor in its variety *H. miliaria*, Nich. Neither have I found evidence of the existence of tabulæ in the smaller tubes of Ure's coral. If we compare Ure's Millepore with *Stenopora*, Lonsd., in which genus both it and Phillips's species were formerly placed, we find that it differs in several important points of structure from *Stenopora*. The latter, according to Prof. Nicholson ('Tabulate Corals,' p. 168), has the tabulæ remote and complete, with annular thickenings in the walls of its tubes, and also has small mural pores in its walls, these being characters not found in Ure's coral, which, while it has certain resemblances in its external form, ornamentation, and the internal arrangement of its corallites to *Heterotrypa* and *Stenopora*, yet differs so distinctly from either genus in possessing perforated tabulæ, that neither of these genera, nor any other with which I am at present acquainted, will admit the form under description as at present these other genera are defined. This being the case, I propose to place, provisionally, Ure's "Millepore" in the *Monticulipora* group, under the new subgeneric name of *Tabulipora*, this name being descriptive of its beautiful and interesting internal structure, which, so far as at present known, distinguishes this organism from all its near allies; and at the same time I shall restore to it Fleming's name of *Uru*, after its original discoverer and describer, the Rev. David Ure, the earliest pioneer of Scottish palæontology.

I am, Gentlemen,

Faithfully yours,
JOHN YOUNG.

Hunterian Museum,
University of Glasgow,
August 8, 1883.

XX.—*Descriptions of some new Species of Lepidoptera.*
By ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

THE species here described have for the most part recently been added to the collection of the British Museum.